UNITED STATES PATENT AND TRADEMARK OFFICE

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590	01/10/2006	

BACON & THOMAS, PLLC
625 Slaters Lane - 4th Floor
Alexandria, VA 22314-1176

EXAMINER
CORRIELUS, JEAN M

ART UNIT	PAPER NUMBER
2162	

DATE MAILED: 01/10/2006

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,291	02/13/2001	Jong Bum Na	EM/NA/6531	9466

TITLE OF INVENTION: OPTIMAL HIGH-SPEED MULTI-RESOLUTION RETRIEVAL METHOD ON LARGE CAPACITY DATABASE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	04/10/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 07/05) Approved for use through 04/30/2007.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: <u>Mail</u>

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

or <u>Fax</u> (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590   01/10/2006

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

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09/781,291	02/13/2001	Jong Bum Na	EM/NA/6531	9466

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nonprovisional	YES	$700	$300	$1000	04/10/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
CORRIELUS, JEAN M	2162	707-100000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are enclosed:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s):

❑ A check in the amount of the fee(s) is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.   ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PTOL-85 (Rev. 07/05) Approved for use through 04/30/2007.   OMB 0651-0033   U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 89 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 89 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PTOL-85 (Rev. 07/05) Approved for use through 04/30/2007.

	Application No.	Applicant(s)
Notice of Allowability	09/781,291	NA ET AL.
	Examiner	Art Unit	
	Jean M. Corrielus	2162	$8/8$

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/15/05*.

2. ☒ The allowed claim(s) is/are *1-3, 5-7 and 9-11 renumbered as 1-9*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some*   c) ☐ None of the:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .
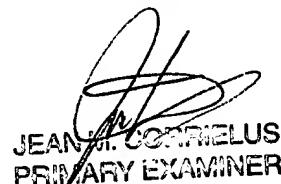
JEAN M. CORRIELUS
PRIMARY EXAMINER

DETAILED ACTION

1.   This office action is in response the amendment filed on June 15, 2005, in which claims

1-11 are presented for further examination.

EXAMINER'S AMENDMENT

2.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with

Ben Urcia on December 7, 2005

In claim

1. (Currently Amended) An optimal high-speed multi-resolution retrieval method on a large
capacity database comprising the steps of:

$\mathcal{B}$ 1

deriving the multi-resolution structure of a query "Q";

setting an initial minimum distance "d_{min}" to have the infinite value;

setting respective values of "i" and "l" to be "1";

deriving "$d^{l}(X_i , Q)$", where $d^{l}(X_i, Q)$ is a distance between a histogram X_i and query Q

at a level l;

deriving "$d^{L}(X_i ,Q)$", where $d^{L}(X_i, Q)$ is a distance between a histogram X_i and query Q

at a level L;

based on results of the steps of deriving d^{l} and d^{L}, obtaining a final value of "d_{min}"; and

selecting data having the final value of "d_{min}" as the best match.

wherein the high-speed multi-resolution retrieval on the database is carried out using an inequality property expressed by the following expression:

$$d(X,Y) \equiv d^L(X,Y) \geq d^{L-1}(X,y) \geq \cdots \geq d^l(X,Y) \geq \cdots \geq d^1(X,Y) \geq d^0(X,Y)$$

2. (Original) The optimal high-speed multi-resolution retrieval method according to claim 1, wherein the step of deriving "$d^l(X_i, Q)$" comprises the steps of:

if "$d^l(X_i, Q)$" is more than "d_{min}", then removing the current candidate "X_i", and updating respective values of "i" and "l" with "i + 1" and "1"; and

if "$d^l(X_i, Q)$" is not more than "d_{min}", then updating "l" with "i + 1".

3. (Original) The optimal high-speed multi-resolution retrieval method according to claim 1, wherein the step of deriving "$d^L(X_i, Q)$" comprises the steps of:

if "$d^L(X_i, Q)$" is more than "d_{min}", then removing the current candidate "X_i"; and

if "$d^L(X_i, Q)$" is not more than "d_{min}", then updating "d_{min}" with "$d^L(X_i, Q)$", and updating respective values of "i" and "l" with "i + 1" and "1".

4. (Canceled)

5. (Currently Amended) An optimal high-speed multi-resolution retrieval method using a cluster-based multi-resolution search algorithm adapted to output one best match, comprising the steps of:

performing a high-speed multi-resolution exhaustive search algorithm, thereby searching for a cluster "k_{min}" having a minimum distance "d'_{min}";

setting an initial value of the "d_{min}" to "d'_{min}", applying the high-speed multi-resolution exhaustive search algorithm to "$\Phi_{k\,min}$", thereby updating "d_{min}";

deriving "$d^{l_k}(C_k, Q) - \delta_k$"; ~~and~~

selecting data having a final value of "d_{min}" as the best match;

if "$\underline{d^{l_k}(C_k,Q)-\delta_k}$" is more than "$d_{min}$", removing the cluster "k";

if "$\underline{d^{l_k}(C_k,Q)-\delta_k}$" is not more than "$d_{min}$", applying the high-speed multi-resolution

exhaustive search algorithm to "Φ_k", thereby updating "d_{min}"; and

updating "k" with "k + 1".

6. (Previously Presented) The optimal high-speed multi-resolution retrieval method according to claim 5, wherein the high-speed multi-resolution retrieval using the cluster-based multi-resolution search algorithm is carried out using an inequality property expressed by the following expression:

If $d^{l_k}(C_k,Q)-\delta_k > d_{min}$, then $X_i^{min} \in \Phi_k d(X_i,Q) > d_{min}$

where, l_k # L.

7. (Original) The optimal high-speed multi-resolution retrieval method according to claim 5, wherein "d_{min}" is updated with a value expressed by the following expression:

$$d_{min} = X_i^{min} \in \Phi_{k_{min}} d^L(X_i,Q),$$

Further comprising the steps of:

setting "k" to "1"; and

if k = k_{min}, updating "k" with "k + 1".

8. (Canceled)

9. (Original) An optimal high-speed multi-resolution retrieval method using a cluster-based multi-resolution search algorithm adapted to output a plurality of more-significant best matches, comprising the steps of:

performing a high-speed multi-resolution exhaustive search algorithm, thereby searching for a cluster "k_{min}" having a minimum distance "d'_{min}";

if n ($\Phi_{k_{min}}$) ∃ M, searching for M more-significant best matches in accordance with an algorithm modified from the high-speed multi-resolution exhaustive search algorithm to search for the M more-significant best matches, and storing respective distance values of the searched more-significant best matches "$d_{min}[\cong]$";

setting "k" to "1", and if k = k_{min}, updating "k" with "k + 1";

if $d^{l_k}(C_k, Q) - \delta_k$ > $d_{min}[0]$, removing the cluster "k", and updating "k" with "d + 1";

setting "k" to "1", and if it is determined that the cluster "k" has been searched for, updating "k" with "k + 1";

if $d^{l_k}(C_k, Q) - \delta_k$ > $d_{min}[M - 1]$, removing the cluster "k", and updating "k" with "d + 1";

updating "$d_{min}[\cong]$" while applying the modified high-speed multi-resolution exhaustive search algorithm to "Φ_k", and updating "k" with "k + 1"; and

selecting M data corresponding to a final "$d_{min}[\cong]$" as best matches, respectively.

10. (Previously Presented) The optimal high-speed multi-resolution retrieval method according to claim 9, wherein the high-speed multi-resolution retrieval using the cluster-based multi-resolution search algorithm is carried out using an inequality property expressed by the following expression:

If $d^{l_k}(C_k, Q) - \delta_k$ > $d_{min}[M - 1]$, then $X_i^{min} \in \Phi_k d(X_i, Q) > d_{min}[M - 1]$.

11. (Original) The optimal high-speed multi-resolution retrieval method according to claim 9, further comprising:

if $n\,(\Phi_{k_{min}})$ < M, filling if $n\,(\Phi_{k_{min}})$ distance values in "$d_{min}[\cong]$" in the order of higher values, starting from the lowest value, and storing the remaining elements of "$d_{min}[\cong]$" with the infinite value.

Allowable Subject Matter

3.   Upon searching a variety of databases, the examiner respectfully submits that claims 1-3, 5-7 and 9-11 are allowable in light of the Applicant's arguments and the prior art made of record.

Conclusion

4.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean M. Corrielus whose telephone number is (571) 272-4032. The examiner can normally be reached on 10 hours shift.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business Center

(EBC) at 866-217-9197 (toll-free).

Jean M Corrielus
Primary Examiner
Art Unit 2162

January 7, 2006